

## Project Development Phase

### Model Performance Test

<b>Date</b>	18 November 2022
<b>Team ID</b>	PNT2022TMID27707
<b>Project Name</b>	Real-Time Communication Using AI for Specially Abled
<b>Maximum Marks</b>	10 Marks

### Model Performance Testing:

The below table consists of information in model performance by the project team,

S.no	Parameter	Values
1.	Model Summary	<p>Total amount of Test data imported – <b>2250 images in 9 classes.</b></p> <p>Total amount of Training data – <b>15750 images in 9 classes.</b></p> <p>Length of the Training set – <b>18</b></p> <p>Length of the Test set – <b>3</b></p>
2.	Accuracy	<p>Model Accuracy - <b>0.7874015748031497</b></p> <p>Training Accuracy – <b>0.9991</b></p> <p>Validation Accuracy – <b>0.9760</b></p>

### Screenshots:

The Screenshots below are for the Model Performance Testing table,

#### Model Screenshot:

```

In [9]: from tensorflow.keras.preprocessing.image import ImageDataGenerator

In [10]: spatial_dropout=0.05
         recurrent_dropout=0.1

In [11]: # Training Datagen
         train_datagen = ImageDataGenerator(rescale=1/255, zoom_range=0.2, horizontal_flip=True, vertical_flip=False)
         # Testing Datagen
         test_datagen = ImageDataGenerator(rescale=1/255)

In [12]: # Training Dataset
         x_train=train_datagen.flow_from_directory('/content/drive/MyDrive/dataset/training_set', target_size=(64,64), class_mode='categorical', batch_size=900)
         # Testing Dataset
         x_test=test_datagen.flow_from_directory('/content/drive/MyDrive/dataset/test_set', target_size=(64,64), class_mode='categorical', batch_size=900)

Found 15750 images belonging to 9 classes.
Found 2250 images belonging to 9 classes.

In [13]: print("Len x-train : ", len(x_train))
         print("Len x-test : ", len(x_test))

Len x-train : 18
Len x-test : 3

In [14]: # The Class Indices in Training Dataset
         x_train.class_indices

Out[14]: {'A': 0, 'B': 1, 'C': 2, 'D': 3, 'E': 4, 'F': 5, 'G': 6, 'H': 7, 'I': 8}

In [15]: # Importing Libraries
         from tensorflow.keras.models import Sequential
         from tensorflow.keras.layers import Convolution2D, MaxPooling2D, Flatten, Dense

In [16]: # Creating Model
         model=Sequential()

```

## Accuracy Screenshot:

```
In [40]: # Fitting the Model Generator
model.fit_generator(x_train, steps_per_epoch=len(x_train), epochs=10, validation_data=x_test, validation_steps=len(x_test))

C:\Users\vasanth\AppData\Local\Temp\ipykernel_12712\1042518445.py:2: UserWarning: `Model.fit_generator` is deprecated and will be removed in a future version. Please use `Model.fit`, which supports generators.
  model.fit_generator(x_train, steps_per_epoch=len(x_train), epochs=10, validation_data=x_test, validation_steps=len(x_test))

Epoch 1/10
18/18 [=====] - 28s 2s/step - loss: 1.1885 - accuracy: 0.6356 - val_loss: 0.3970 - val_accuracy: 0.9084
Epoch 2/10
18/18 [=====] - 23s 1s/step - loss: 0.2429 - accuracy: 0.9309 - val_loss: 0.2971 - val_accuracy: 0.9409
Epoch 3/10
18/18 [=====] - 22s 1s/step - loss: 0.0933 - accuracy: 0.9761 - val_loss: 0.1903 - val_accuracy: 0.9724
Epoch 4/10
18/18 [=====] - 22s 1s/step - loss: 0.0483 - accuracy: 0.9889 - val_loss: 0.2213 - val_accuracy: 0.9733
Epoch 5/10
18/18 [=====] - 22s 1s/step - loss: 0.0281 - accuracy: 0.9933 - val_loss: 0.2241 - val_accuracy: 0.9733
Epoch 6/10
18/18 [=====] - 21s 1s/step - loss: 0.0201 - accuracy: 0.9953 - val_loss: 0.2540 - val_accuracy: 0.9756
Epoch 7/10
18/18 [=====] - 22s 1s/step - loss: 0.0122 - accuracy: 0.9975 - val_loss: 0.2513 - val_accuracy: 0.9756
Epoch 8/10
18/18 [=====] - 21s 1s/step - loss: 0.0089 - accuracy: 0.9984 - val_loss: 0.2877 - val_accuracy: 0.9769
Epoch 9/10
18/18 [=====] - 23s 1s/step - loss: 0.0065 - accuracy: 0.9990 - val_loss: 0.2771 - val_accuracy: 0.9764
Epoch 10/10
18/18 [=====] - 21s 1s/step - loss: 0.0055 - accuracy: 0.9991 - val_loss: 0.2952 - val_accuracy: 0.9760

Out[40]:

In [41]: model.save('asl_model_84_54.h5')
```